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Bilateral Trade between Türkiye and the EU: An Analysis on Trade Indicators

Türkiye ile AB Arasındaki İkili Ticaret: Ticaret Ölçütleri Üzerinden Bir Analiz

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Abstract: The aim of the study is to analyze the bilateral trade between Türkiye and the European Union (EU). In the study, foreign trade data of 97 product groups with 2-digit Harmonized System (HS) obtained from the Trade Map (2024) database for the period 2001-2022 were analyzed. Trade Complementarity Index (TCI), Trade Intensity Index (TII), Revealed Comparative Advantage (RCA) and Bilateral Revealed Comparative Advantage (BRCA) indices were used to analyze these data. The study reveals that trade complementarity between Türkiye and the EU is high. Türkiye and the EU are found to have trade intensity and competitive advantage in different products in general. Therefore, bilateral trade is complementary rather than competitive. Türkiye's bilateral trade with the EU is characterized by high trade intensity and competitiveness, especially in textile and clothing products.

Keywords: Bilateral Trade, Trade Complementarity, Trade Intensity, Comparative Advantages, International Trade.

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Öz: Çalışmanın amacı, Türkiye ile Avrupa Birliği (AB) arasındaki ikili ticaretin analiz edilmesidir. Çalışmada, 2001-2022 dönemi için Trade Map (2024) veritabanından elde edilen Harmonize Sistem (HS) 2 basamaklı 97 ürün grubunun dış ticaret verileri analiz edilmiştir. Bu veriler üzerinden Ticaret Tamamlayıcılık Endeksi (TCI), Ticaret Yoğunluk Endeksi (TII), Açıklanmış Karşılaştırmalı Üstünlük (RCA) ve İkili Açıklanmış Karşılaştırmalı Üstünlük (BRCA) endeksleri ile analizler yapılmıştır. Çalışma sonucunda, Türkiye ile AB arasında ticaret tamamlayıcılığının yüksek olduğu ortaya çıkmıştır. Türkiye ile AB'nin genel olarak farklı ürünlerde ticaret yoğunluğuna ve rekabet üstünlüğüne sahip olduğu tespit edilmiştir. Dolayısıyla ikili ticaretin rekabetten çok tamamlayıcı olduğu anlaşılmıştır. Türkiye'nin AB ile ikili ticaretinde, özellikle tekstil ve giyim ürünlerindeki ticaret yoğunluğu ve rekabet gücünün yüksek olduğu belirlenmiştir.

Anahtar Kelimeler: İkili Ticaret, Ticaret Tamamlayıcılığı, Ticaret Yoğunluğu, Karşılaştırmalı Üstünlükler, Uluslararası Ticaret.

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1. Introduction

The European Union (EU), comprising 27 countries, represents the largest political and economic organization in the world. Despite representing approximately 6% of the global population, the EU is among the world's most prominent economic and trade entities (EU, 2023). With a gross domestic product (GDP) of USD 15.1 trillion, the EU has the second largest economy in the world, surpassed only by the United States. Nevertheless, the EU's substantial and heterogeneous market structure, sophisticated infrastructure, rigorous technical standards, and consistent sanitary and plant health measures across member countries render it a crucial market for Türkiye (TİM, 2024).

The most foundational aspect of the economic relationship between Türkiye and the European Union was the formalization of the Ankara Agreement on September 12, 1963 (MFA, 2022). The agreement came into force on December 1, 1964. On January 1, 1996, the Customs Union between Türkiye and the EU came into effect. The Customs Union between Türkiye and the EU encompasses only industrial products and processed agricultural products, while traditional agricultural products are excluded (Topcu and Kılavuz, 2012: 24). Before proceeding to an examination of bilateral trade data between Türkiye and the EU, it is first necessary to present data on Türkiye's foreign trade, which is provided in Table 1.

Table 1: Türkiye's Foreign Trade Data (Million USD Dollars)

	Export	Import	Trade Volume	Net Trade
2001	31334	41399	72733	-10065
2002	36059	51550	87609	-15491
2003	47253	69337	116590	-22084
2004	63167	97538	160705	-34371
2005	73476	116771	190247	-43295
2006	85534	139572	225106	-54038
2007	107272	170063	277334	-62791
2008	132027	201964	333991	-69937
2009	102143	140928	243071	-38785
2010	113883	185544	299428	-71661
2011	134907	240842	375749	-105935
2012	152462	236545	389007	-84083
2013	161481	260823	422304	-99342
2014	166505	251142	417647	-84637
2015	143844	207236	351080	-63392
2016	142606	198602	341208	-55996
2017	156993	233800	390793	-76807
2018	167924	223047	390971	-55123
2019	180871	210347	391218	-29476
2020	169658	219514	389172	-49856
2021	225264	271423	496687	-46159
2022	254172	363711	617883	-109539

Source: Based on Trade Map (2024) data.

As illustrated in Table 1, Türkiye's exports, which were approximately 31 billion dollars in 2001, reached 254 billion dollars in 2022. Concomitantly, Türkiye's imports increased from 41 billion dollars to 364 billion dollars over the same period. The foreign trade deficit of Türkiye widened significantly, reaching nearly USD 110 billion in 2022. Although Türkiye has demonstrated considerable growth in exports, the foreign trade deficit remains a significant concern. Moreover, Türkiye's total foreign trade volume is estimated to be approximately 618 billion dollars.

The EU is the leading export and import partner of Türkiye. Consequently, the EU occupies a significant position in Türkiye's foreign trade. Table 2 presents data on foreign trade between Türkiye and the EU.

Table 2: Foreign Trade between Türkiye and the EU* (Million US Dollars)

	Export from Türkiye to the EU	Import from Türkiye to the EU	Trade Volume	Net Trade	Export share	Import Share	Foreign Trade Share
2001	15602	17934	33536	-2332	0.50	0.43	0.46
2002	17655	23277	40933	-5622	0.49	0.45	0.47
2003	24131	31689	55820	-7558	0.51	0.46	0.48
2004	31626	43843	75469	-12217	0.50	0.45	0.47
2005	36366	48129	84494	-11763	0.49	0.41	0.44
2006	42208	54346	96554	-12139	0.49	0.39	0.43
2007	53052	63056	116108	-10004	0.49	0.37	0.42
2008	56623	69307	125930	-12684	0.43	0.34	0.38
2009	42060	53186	95246	-11126	0.41	0.38	0.39
2010	46676	67769	114445	-21094	0.41	0.37	0.38
2011	55463	85683	141146	-30219	0.41	0.36	0.38
2012	51715	82105	133820	-30390	0.34	0.35	0.34
2013	59420	90363	149783	-30944	0.37	0.35	0.35
2014	63385	87245	150629	-23860	0.38	0.35	0.36
2015	54455	73213	127668	-18758	0.38	0.35	0.36
2016	57592	72241	129833	-14649	0.40	0.36	0.38
2017	65406	78725	144131	-13318	0.42	0.34	0.37
2018	74081	73436	147517	645	0.44	0.33	0.38
2019	78049	67976	146025	10072	0.43	0.32	0.37
2020	70896	73419	144316	-2523	0.42	0.33	0.37
2021	94333	85509	179842	8824	0.42	0.32	0.36
2022	105239	93405	198644	11835	0.41	0.26	0.32

*The most recent EU membership consists of 27 countries. Therefore, EU countries are used as the basis.

Source: Based on Trade Map (2024) data.

As seen in Table 2, there has been a notable surge in the volume of trade between Türkiye and the EU. What is noteworthy is that Türkiye, which had a trade deficit with the EU during the 2001-2018 period, posted a trade surplus with the EU during the 2018-2022 period, with the exception of 2020. Conversely, while Türkiye's foreign trade volume with the EU has been increasing, the share of the EU in Türkiye's foreign trade has been decreasing. Nevertheless, the EU remains the most important foreign trade partner for Türkiye. However, the significant investments of EU countries in Türkiye and the Customs Union between the two sides, which was finalized in 1996, point to a trade relationship that goes beyond these trade data. Table 3 presents the foreign trade data of the EU, which is a significant actor in Türkiye's foreign trade.

Table 3: The EU's Foreign Trade Data (Million US Dollars)

	Export	Import	Trade Volume	Net Trade
2001	2145791	2076893	4222683	68898
2002	2307884	2177442	4485327	130442
2003	2770852	2649812	5420664	121040
2004	3333778	3218703	6552480	115075
2005	3589702	3535667	7125369	54034
2006	4072359	4102364	8174722	-30005
2007	4816537	4826930	9643467	-10394
2008	5358356	5474762	10833118	-116406
2009	4158425	4095100	8253525	63325
2010	4658195	4627454	9285649	30742
2011	5466069	5447994	10914062	18075
2012	5208233	5057054	10265287	151178
2013	5408967	5151891	10560858	257076
2014	5524096	5239146	10763242	284950
2015	4785951	4474996	9260946	310955
2016	4826842	4487402	9314244	339440
2017	5286364	4994333	10280697	292031
2018	5824401	5605597	11429998	218804
2019	5647746	5379617	11027363	268129
2020	5306035	5008449	10314484	297586
2021	6462701	6355553	12818254	107149
2022	6937724	7262253	14199977	-324529

Source: Based on Trade Map (2024) data.

As illustrated in Table 3, the EU's exports and imports exhibited a notable surge during the 2001-2022 period. During this period, the EU exhibited a positive balance of trade, with the exception of select years (2006, 2007, 2008, and 2022). With a foreign trade volume of over 14 trillion dollars, the EU occupies a significant position in the global market. Moreover, the accession countries have also made a significant contribution to the growth of the EU's foreign trade. In this regard, the following countries joined the EU in 2004: the Czech Republic, Hungary, Poland, Slovakia, Slovenia, Lithuania, Latvia, Estonia, Malta, and Cyprus. Bulgaria and Romania were admitted to the European Union in 2007. In 2013, the EU expanded to 28 members with the accession of Croatia. Nevertheless, the United Kingdom withdrew from the EU in 2020. Consequently, the final number of members in the EU was 27.

A comparison of Tables 2 and 3 reveals that Türkiye's share in the EU's foreign trade has increased from 8 per thousand in 2001 to 14 per thousand in 2022. In this regard, although Türkiye's share of the EU's foreign trade remains relatively modest, it is nevertheless increasing at a steady pace.

2. Literature Review

The literature review encompasses studies examining trade relations between Türkiye and the EU, as well as an overview of research on trade complementarity, trade intensity, competitive advantage, and bilateral competitive advantage.

In a study conducted by Kösekahyaoğlu (2003), Türkiye's competitiveness in relation to the EU was analyzed for two distinct periods: 1978-1980 and 1988-1990. The findings revealed that Türkiye exhibited a comparative disadvantage in medium and high technology industries, while displaying a comparative advantage in low technology industries. In a subsequent investigation conducted by Erlat and Erlat (2005),

Türkiye's competitive advantage within the EU market was examined during the period spanning 1999 to 2000. The findings indicated that Türkiye exhibited a competitive advantage in both labor-intensive products and raw material-intensive product groups. Vergil and Yıldırım (2006) conducted an analysis of the competitiveness between Türkiye and the EU for the period between 1993 and 2002. It can be concluded that the customs union has a positive effect on Türkiye's competitiveness in both advanced technology goods and research-intensive goods that are difficult to imitate. Conversely, it has a negative effect on Türkiye's competitiveness in capital-intensive goods and intermediate technology goods. Serin and Civan (2008) conducted an investigation into Türkiye's comparative advantage in the tomato, olive oil, and fruit juice industries within the EU market between the years 1995 and 2005. The findings revealed that Türkiye possesses a markedly pronounced comparative advantage in the fruit juice and olive oil markets within the EU. Altay et al. (2009), in their study for the period 1995-2007, found that Türkiye is more advantageous in products with low value added compared to EU (15) countries. Topcu and Kılavuz (2012) conducted an investigation into Türkiye's competitiveness in comparison to the EU following the formation of the Customs Union, with a focus on the period between 1996 and 2006. The findings indicate that Türkiye possesses a comparative advantage in select low- and medium-low technology sectors, whereas it exhibits a comparative disadvantage vis-à-vis the EU in high-technology products. In this context, it is emphasized that the Customs Union has not played a significant role in altering the comparative advantages of the Turkish manufacturing sector. Karaalp (2012) conducted an analysis of the competitiveness between Türkiye and the EU within the context of the manufacturing industry sectors over the period 1988-2008. It is emphasised that the Customs Union established between the EU and Türkiye has a positive impact on the competitive advantage of Turkish manufacturing sectors. As a result of the study, it is determined that Türkiye has a comparative advantage in terms of labor-intensive goods such as clothing and textiles, despite Türkiye's trends from low and medium-low technology industries to medium-high technology industries. Eşiyok (2014) investigated the competitiveness between Türkiye and the EU for the period 2008-2013. As a result, while Türkiye's competitiveness in high-tech sectors against the EU is low, Türkiye's competitiveness against the EU is high only in low-tech sectors. Özdamar (2014) analyzed the structure of Türkiye's trade with the EU (28) according to different technology levels of the manufacturing industry for the period 1996-2012. The weighted average of Türkiye's exports to the EU is indicative of a medium-low technology level, while the weighted average of Türkiye's imports from the EU corresponds to a medium-advanced technology level. Türkiye has consistently faced a competitive disadvantage vis-à-vis the EU in both advanced technology industries and medium-high technology industries throughout the period under review. Conversely, in Türkiye's trade with the EU, Türkiye exhibits a high competitive advantage in low-technology industries and a low competitive advantage in medium-low technology industries. The export profile of Türkiye to the EU is characterised by a concentration in advanced, medium-advanced and low technology industry groups. However, the imports from the EU are concentrated in medium-advanced technology industries, with a partial concentration in advanced technology industries. Başkol and Özözen (2019) found that the Turkish clothing industry exhibited a competitive advantage in the EU (15) market in the 2004-2017 period and almost all of the 37 sub-sectors exhibited a net export structure. Karaman et al. (2023) examined the competitiveness of Türkiye's agricultural exports to the EU and the Shanghai Cooperation Markets (SCO). It was observed that Türkiye has a competitive advantage in fruit and vegetable exports to the EU and SCO countries. In addition to the studies on competitive advantages between Türkiye and the EU, there are also studies on trade complementarity and trade intensity. Saygılı and Terzioglu (2008) found that trade complementarity between Türkiye and the EU was low in the 1985-2004 period. In this respect, it is argued that the Customs Union agreement between the two parties has not been sufficiently beneficial. Yılmaz and Akkaya (2020) analyzed the concentration in foreign trade between Türkiye and the EU for the years 2000-2019. It is found that the concentration in Türkiye's foreign trade with the EU decreased in this period. While Türkiye's foreign trade concentration decreased with the top 4 EU countries with which Türkiye has the most trade, there was no significant change with the top 8 EU countries with which Türkiye has the most trade. Doğan and Soyyiğit Kaya (2011) analyzed the country and product concentration in trade between Türkiye and the EU in the period 1996-2009. As a result of the

study, it is found that Türkiye's exports to the EU have shifted from low-technology products to medium-high technology products, while there has been no significant change in imports.

In addition, studies analyzing bilateral trade with Türkiye are included. Gul (2014) analyzed the trade between Türkiye and Pakistan for the years 2003-2012. According to the study, the trade complementarity between Türkiye's exports and Pakistan's imports is higher than the trade complementarity between Pakistan's exports and Türkiye's imports. Şimşek et al. (2017a) analyzed the bilateral trade between Türkiye and Russia between 1996 and 2014 and found that trade complementarity between the two countries was low in the period between 1990 and 2000. After 2000, it was found that trade complementarity between the two countries increased and both sides gained more from the trade. At the same time, Türkiye's competitiveness vis-à-vis Russia has increased mostly in labor-intensive sectors. Şimşek et al. (2017b) analyzed the bilateral trade relations between Türkiye and Kazakhstan in the period 1995-2009. The study concluded that the trade complementarity between Kazakhstan's exports and Türkiye's imports is higher than the trade complementarity between Türkiye's exports and Kazakhstan's imports. Çelen and Demirel (2018) examined the trade complementarity between Türkiye and selected countries with which Türkiye does foreign trade for the years 2011-2015. Türkiye's trade complementarity with Kuwait, Saudi Arabia, Uzbekistan, Qatar and Austria was found to be high. On the other hand, Türkiye's trade complementarity with Singapore, Malta, Greece, India and Japan was found to be low. Erkan and Aybudak (2019) employed the TCI to examine the bilateral trade relationship between Türkiye and South Korea over the 2000-2018 period. The results indicate that South Korea, in its role as an importer, is not an optimal partner for Türkiye's exports. Conversely, Türkiye, in its role as an importer, represents a more suitable partner for South Korea's exports. This is due to the fact that the product pattern of Türkiye's imports is more aligned with the product pattern of South Korea's exports. Chabi and Saygili (2020) analyzed foreign trade between Türkiye and the Economic Community of West African States (ECOWAS) for the period 2001-2017 and found that there is trade potential between Türkiye and ECOWAS. In this context, a trade agreement between Ghana and Guinea and Türkiye would be advantageous, whereas an agreement between Liberia and Mali and Türkiye would not be advantageous. It was also noted that an agreement between Türkiye and ECOWAS should include more processed food, textile, and cotton processing facilities. Demir (2020) conducted an analysis of Türkiye's bilateral trade with BRICS over the course of the 2010-2019 period. The findings revealed that bilateral trade between the two entities had undergone notable growth. However, the results also indicated that Türkiye had incurred a deficit in its foreign trade due to its bilateral trade relations with BRICS, with the bilateral trade flows favoring the BRICS group member countries. Ergün Tatar (2021) employed the TII to analyze Türkiye's foreign trade with Pakistan, Egypt, Morocco, Jordan, and Tunisia over the period 2010-2019. The findings of the study indicate that Egypt has the most intensive export and import relationship with Türkiye. Nevertheless, the export intensity index values for Egypt, Morocco, Jordan, and Tunisia are also notable. Pakistan, conversely, has been observed to exhibit a lesser degree of trade activity than anticipated with respect to its export operations. Şimşek and Kurt (2021) analyzed the bilateral trade of Türkiye and Uzbekistan with the BRCA and TCI indexes. The article showed that there is a great potential for further development of economic relations between Uzbekistan and Türkiye. Akay (2023) employed the bilateral trade relationship between Türkiye and Azerbaijan as a case study to examine the effectiveness of the BRCA index. The study revealed that Türkiye's exports of goods with a comparative advantage account for 78% of its total exports. While Azerbaijan has a comparative advantage in a smaller number of goods than Türkiye, these products account for 80% of its total exports. Ateş (2024) analyzed Türkiye's trade with the African Continental Free Trade Area (AFCFTA) countries from 2014 to 2023. It was observed that Türkiye is primarily engaged in the production of manufactured products, industrial and machinery products, while AFCFTA countries are predominantly focused on agriculture, livestock, and the provision of various raw materials to Türkiye. Moreover, the trade relationship between the two sides has demonstrated a greater degree of complementarity. Erkekoğlu and Koçer (2024) conducted an analysis of Türkiye's and Russia's foreign trade relations over the 2005-2020 period. Consequently, the diversification of Türkiye's exports to Russia is greater than that of its imports. Simultaneously, Türkiye has a comparative advantage in 16 out of 21 commodity groups, no comparative advantage in 4 commodity groups and neutral results in 1 commodity group. Kurt Gümüş and Kramskova (2024) analyzed the bilateral trade between Türkiye and Russia for the period 1992-2021. The analysis

demonstrated that the intensity and complementarity of trade between Türkiye and Russia are considerable. Concurrently, the observation that the two countries possess distinct comparative advantages in various products lends further support to this finding.

A substantial proportion of the research examining trade between Türkiye and the EU is dedicated to analysing competitive advantage (Kösekahyaoğlu, 2003; Erlat and Erlat, 2005; Saygılı and Terzioglu, 2008; Serin and Civan, 2008; Altay et al., 2009; Topcu and Kılavuz, 2012; Karaalp, 2012; Eşiyok, 2014; Özdamar, 2014; Başkol and Özözen, 2019; Karaman et al., 2023). Conversely, there is a growing interest in the literature on countries' trade intensity and trade complementarities (İbrahim and Abdulaziz, 2018; Wang et al., 2018; Zheng et al., 2018; Shnyrkov and Pliushch, 2019; Xu ve Li, 2019; Liu vd., 2020; Tabassum, 2021; Yao, 2021; Edjah et al., 2022; Bashimov, 2023; Aydın and Bashimov, 2024). Nevertheless, the number of studies on Türkiye's trade intensity (Şimşek et al., 2017b; Ergün Tatar, 2021; Kurt Gümüş and Kramskova, 2024) and trade complementarity (Saygılı and Terzioğlu, 2008; Gul, 2014; Şimşek et al., 2017a; Çelen and Demirel, 2018; Erkan and Aybudak, 2019; Chabi and Saygili, 2020; Şimşek and Kurt, 2021; Kurt Gümüş and Kramskova, 2024) and bilateral comparative advantage (Şimşek et al., 2017b; Şimşek and Kurt, 2021; Akay, 2023; Kurt Gümüş and Kramskova, 2024) remains relatively limited. In light of the pivotal role the EU plays in Türkiye's foreign trade, this study is a crucial endeavor. The objective of this study is to examine Türkiye's bilateral trade with the EU, which occupies a significant position in Türkiye's foreign trade, through the lenses of trade intensity, trade complementarity, competitive advantage, and bilateral competitive advantage. Initially, an investigation into the trade complementarity between Türkiye and the EU will determine whether the two entities are "natural trading partners". The analysis of trade concentration will allow for an examination of the export and import concentration of both Türkiye and the EU, with a view to identifying any changes in trade intensity. Concurrently, the product scope of trade concentration will be examined to ascertain which products are predominant in bilateral trade. The calculations of competitive advantage and bilateral competitive advantage will demonstrate which product groups Türkiye and the EU have a competitive advantage in. Furthermore, it is anticipated that a more comprehensive perspective will be attained by integrating the index calculations into a unified framework, as opposed to the isolated approach employed in previous studies. It is anticipated that the study will make a significant contribution to the existing literature on this topic.

3. Data and Methods

3.1. Data

This study examines the foreign trade data of 97 product groups in the 2-digit Harmonized System (HS) for bilateral trade between Türkiye and the EU. In this study, the EU (27) is selected from the Trade Map (2024) database, as the number of EU member states is 27. The data on foreign trade were obtained for the period from 2001 to 2022. The TCI, TII, RCA, and BRCA indexes were employed to analyze the aforementioned data.

3.2. Methods

3.2.1. Trade Complementarity Index (TCI)

The trade complementarity index was developed by Michaely (1996). This index gauges the extent to which a country's trade is complementary to that of another country or region with which it engages in bilateral trade (Michaely, 1996: 21). This index indicates the extent to which a country's exports align with the imports of another country or region. This index is calculated as in equation 1 (Bashimov, 2023: 198):

$$TCI_{ij} = 100 * \left[1 - \sum_k \left(\left|\frac{m_{jk}}{M_j} - \frac{x_{ik}}{X_i}\right| /2\right)\right] \quad (1)$$

Where,

TCI_{ij} = Trade complementarity index between two countries,

m_{jk}= country *j*'s imports of product *k*,

M_j= total imports of country *j*,

x_{ik}= country *i*'s exports of product *k*,

X_i= total exports of country *i*.

This index assumes values between 0 and 100. When exports and imports between two parties are perfectly aligned, the index assumes a value of 100 (Kašťáková and Luptáková, 2023: 6). In this instance, the two parties are deemed to be optimal trading partners (Bashimov, 2023: 198). In the absence of trade between the two parties, the index assumes a value of 0 (World Bank, 2010). In essence, values approaching 0 indicate a low level of trade complementarity, while values approaching 100 indicate a high level of trade complementarity. This index, which fluctuates over time, can indicate that trade between two parties has become more or less harmonized (Chabi and Saygili, 2020: 195).

3.2.2. Trade Intensity Index (TII)

The trade intensity index was initially developed by Brown (1949) and subsequently revised by Kojima (1964). The index enables the measurement of trade intensity between two parties in comparison with other parties (Kojima 1964: 19). In other words, this index indicates whether a country exports more than the world exports to the country with which it trades on average in bilateral trade (Şimşek et al., 2017b: 10). The manner in which this index is calculated is illustrated in Equation 2 (World Bank, 2010):

$$TII_{ij} = (x_{ij} / X_i) / (x_{wj} / X_w) \quad (2)$$

Where,

TII_{ij}= Trade intensity index,

x_{ij}= exports from country *i* to country or region *j*,

X_i = total exports of country *i*,

x_{wj}= exports from the world to country or region *j*,

X_w = refers to total world exports.

This index is defined to take values between 0 and +∞. Values below 1 indicate a low trade intensity, while values above 1 indicate a high trade intensity between the two parties (Maryam et al., 2018: 1186). This index is also employed to calculate import intensity (Ateş and Dilekoğlu, 2021: 235).

The methodology for calculating this index on a product basis is presented in Equation 3 (Vahalik, 2014: 711).

$$TII_{ijk} = (x_{ijk} / X_{ik}) / (x_{ij} / X_i) \quad (3)$$

Where,

TII_{ijk}= trade intensity index based on product *k*,

x_{ijk}= exports of product *k* from country *i* to country or region *j*,

X_{ik} = *k* product exports from country *i* to the world,

x_{ij}= exports from country *i* to country or region *j*,

X_i = total exports of country *i*.

This index can also be used to calculate the regional import intensity of products (Vahalik, 2014: 711).

3.2.3. Revealed Comparative Advantage Index (RCA)

The revealed comparative advantage (RCA) index was developed by Balassa (1965). The RCA index compares the share of a country's exports of a product or sector in its total exports with those of other countries or country groups (Utkulu and İmer, 2009). The RCA index is represented by the following equation (4):

$$RCA_{ij} = (X_{ij}/X_{it})/(X_{nj}/X_{nt}) = (X_{ij}/X_{nj})/(X_{it}/X_{nt}) \quad (4)$$

Where,

RCA_{ij} = The index of revealed comparative advantage,

X_{ij} = country *i*'s exports of good *j*,

X_{nj} = exports of good *j* by country or group of countries *n*,

X_{it} = total exports of country *i*,

X_{nt} = total exports of country *n* or group of countries.

The RCA value can be expressed as a ratio between 0 and +∞. When the RCA value is greater than 1, it can be concluded that there is a comparative advantage. Conversely, a value of RCA less than 1 indicates a comparative disadvantage.

3.2.4. Bilateral Revealed Comparative Advantage Index (BRCA)

The Bilateral Revealed Comparative Advantage (BRCA) index is based on the RCA index. In contrast to the RCA index, the BRCA index furnishes data on whether a country has a disclosed comparative advantage in the market of another country or group of countries in relation to the rest of the world for a given good (Phan and Jeong, 2012: 16). The calculation of this index is detailed in Equation 5:

$$BRCA_{ik}^{J} = (x_{ik}^{j} / X_{itk}) / (x_{wk}^{j} / X_{wtk}) \quad (5)$$

Where,

$BRCA_{ik}^{J}$= The bilateral index of revealed comparative advantage,

x_{ik}^{j} = country *i*'s exports of good *j*,

X_{itk}= total exports of country *i*,

x_{wk}^{j}= world exports of *j* goods,

X_{wtk}= Total exports from the world to country *k*.

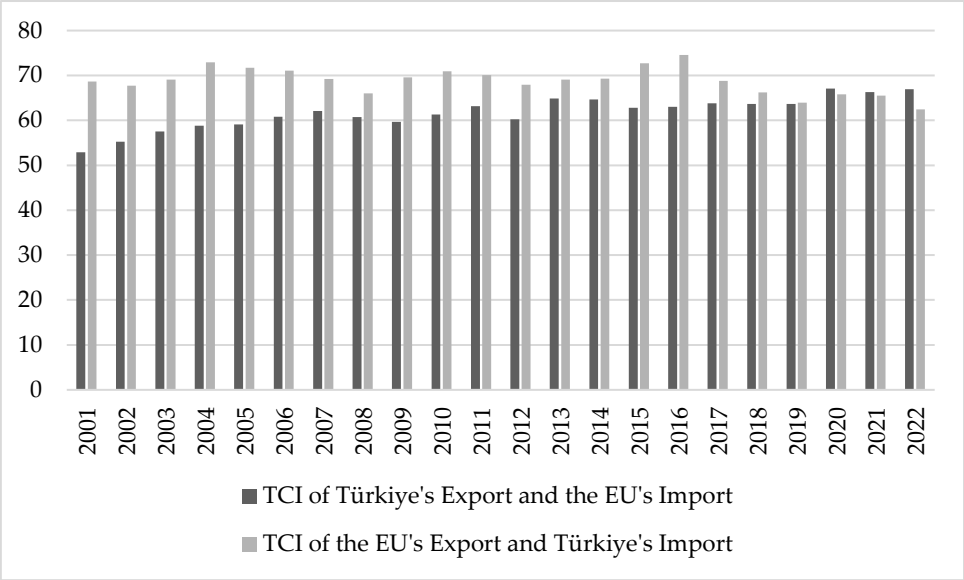
A value resulting from the calculation of this index that is less than 1 indicates a comparative disadvantage in bilateral trade in a certain product or product group. Conversely, a value greater than 1 indicates a comparative advantage (Şimşek et al., 2017b: 18).

4. Results and Discussion

4.1. Results

In order to analyze the bilateral trade relations between Türkiye and the EU, it was first necessary to study trade complementarity, then trade intensification and product groups with competitive advantage.

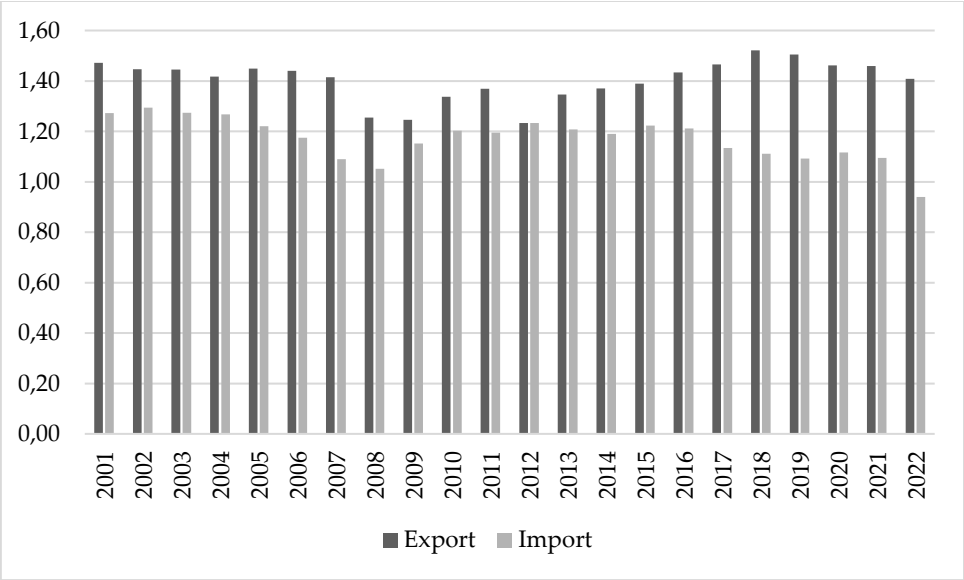
Figure 1: Trade Complementarity between Türkiye and the EU



Source: Calculated from Trade Map (2024) data

Figure 1 illustrates that the trade complementarity of EU exports and Türkiye's imports is greater than the trade complementarity of Türkiye's exports and EU imports. In 2019, the trade complementarities for both parties reached a comparable level. As of 2020, the trade complementarity of Türkiye's exports and the EU's imports has been higher than the trade complementarity of the EU's exports and Türkiye's imports. Over time, the EU's trade complementarity has exhibited a downward trend, while Türkiye's trade complementarity has demonstrated an upward trend. In this regard, it is evident that Türkiye has become more advantageous in terms of bilateral trade and has further fortified this advantage over time. In addition to trade complementarity, Figure 2 presents the values of Türkiye's trade intensity with the EU.

Figure 2: Trade Intensity from Türkiye to the EU



Source: Calculated from Trade Map (2024) data

According to Figure 2, Türkiye's trade intensity with the EU is considerable. In particular, Türkiye's export intensity to the EU is higher than its import intensity. Conversely, although Türkiye's import intensity with

EU countries is high, it has decreased in recent years and is below the world average in 2022. In this context, Table 4 presents the product groups that stand out in Türkiye's export intensity to the EU.

Table 4: TII Results for Top 10 Product Groups with 2-digit HS Code (Export from Türkiye to the EU)

2001		2005		2010		2015		2020		2022	
Code	**Value**	**Code**	**Value**	**Code**	**Value**	**Code**	**Value**	**Code**	**Value**	**Code**	**Value**
'50	1.94	'05	1.84	'05	1.99	'05	2.17	'86	1.84	'86	1.86
'05	1.87	'16	1.66	'61	1.69	'20	1.70	'78	1.68	'74	1.62
'16	1.70	'01	1.58	'03	1.64	'81	1.66	'87	1.58	'87	1.56
'53	1.46	'81	1.49	'42	1.61	'80	1.65	'92	1.47	'76	1.49
'03	1.45	'78	1.48	'87	1.59	'87	1.62	'61	1.46	'61	1.49
'87	1.42	'20	1.38	'63	1.56	'61	1.60	'62	1.46	'62	1.45
'42	1.37	'66	1.33	'62	1.54	'40	1.56	'40	1.42	'63	1.38
'81	1.35	'61	1.32	'40	1.49	'62	1.55	'66	1.37	'78	1.37
'92	1.31	'87	1.31	'20	1.47	'63	1.54	'74	1.37	'40	1.37
'61	1.29	'92	1.29	'66	1.45	'03	1.54	'63	1.37	'79	1.29

Source: Calculated from Trade Map (2024) data

Table 4 illustrates that Türkiye's export product concentration to the EU is primarily comprised of manufacturing products. In 2001, "Silk" ('05) and "Fish and crustaceans, molluscs and other aquatic invertebrates" ('03) were the leading agricultural products, while in 2005 and 2010, "Silk" ('05) had the highest trade concentration value. In 2022, high trade intensity values were observed in the product groups "Railway or tramway locomotives, rolling stock and parts thereof; railway or tramway track fixtures" ('86), "Copper and articles thereof" ('74), "Vehicles other than railway or tramway rolling stock, and parts and accessories thereof" ('87), "Aluminum and articles thereof" ('76) and "Articles of apparel and clothing accessories, knitted or crocheted" ('61). Furthermore, Table 5 presents the prominent product groups in Türkiye's imports from the EU.

Table 5: TII Results for Top 10 Product Groups with 2-digit HS Code (Import from Türkiye to the EU)

2001		2005		2010		2015		2020		2022	
Code	**Value**	**Code**	**Value**	**Code**	**Value**	**Code**	**Value**	**Code**	**Value**	**Code**	**Value**
'86	2.26	'45	2.31	'02	2.74	'06	2.51	'19	2.66	'45	3.68
'45	2.23	'06	2.25	'45	2.57	'19	2.51	'45	2.65	'19	3.55
'06	2.20	'11	2.21	'86	2.51	'45	2.46	'06	2.54	'06	3.30
'13	2.06	'19	2.19	'19	2.48	'87	2.08	'43	2.41	'43	3.14
'19	2.00	'13	2.15	'06	2.48	'01	2.02	'86	2.40	'88	3.08
'35	1.94	'86	1.96	'11	2.06	'33	1.98	'87	2.29	'33	2.83
'43	1.91	'35	1.89	'33	2.06	'20	1.94	'33	2.15	'87	2.79
'97	1.82	'20	1.82	'87	2.02	'34	1.86	'35	2.12	'35	2.67
'87	1.82	'34	1.79	'34	1.97	'35	1.80	'42	2.05	'01	2.52
'56	1.79	'56	1.78	'35	1.84	'21	1.76	'48	2.04	'51	2.50

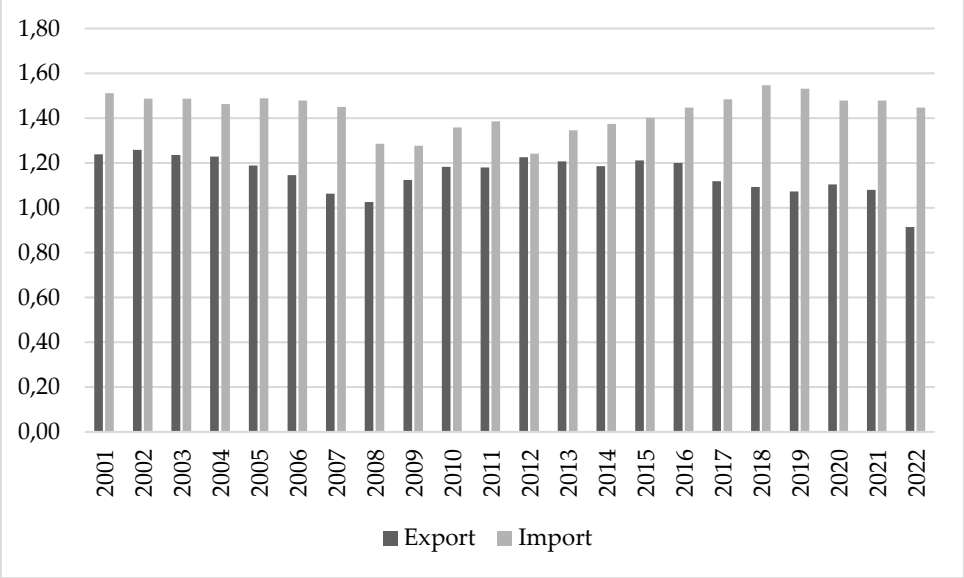
Source: Calculated from Trade Map (2024) data

As seen in Table 5, there have been significant changes in the product groups in which Türkiye's imports from the EU are concentrated in the period from 2001 to 2022. In this context, "Railway or tramway locomotives, rolling stock and parts thereof; railway or tramway track fixtures" ('86) in 2001, "Cork and articles of cork" ('45) in 2005 and 2022, "Meat and edible meat offal" ('02) in 2010 and "Preparations of cereals, flour, starch or milk; pastrycooks' products" ('19) in 2020. In 2022, Türkiye's imports to EU countries

were concentrated in the product groups "Cork and articles of cork" ('45), "Preparations of cereals, flour, starch or milk; pastrycooks' products" ('19), "Live trees and other plants; bulbs, roots and the like; cut flowers and ornamental foliage" ('06), "Furskins and artificial fur; manufactures thereof" ('43) and "Aircraft, spacecraft, and parts thereof" ('88).

Figure 3 presents the values of the European Union's trade intensity with Türkiye.

Figure 3: Trade Intensity from the EU to Türkiye



Source: Calculated from Trade Map (2024) data

Figure 3 illustrates that, despite the EU's high export intensity to Türkiye, this has declined in recent years, reaching a low point in 2022. Conversely, the EU's import intensity from Türkiye is higher. In this context, Table 6 presents the most prominent product groups in the EU's export intensity to Türkiye.

Table 6: TII Results for Top 10 Product Groups with 2-digit HS Code (Export from the EU to Türkiye)

2001		2005		2010		2015		2020		2022	
Code	**Value**	**Code**	**Value**	**Code**	**Value**	**Code**	**Value**	**Code**	**Value**	**Code**	**Value**
'36	17.34	'52	3.65	'52	4.63	'52	3.62	'52	4.67	'52	5.95
'43	6.21	'55	3.42	'51	2.96	'55	2.69	'79	3.78	'55	3.88
'52	4.61	'51	3.11	'72	2.86	'51	2.66	'78	3.51	'51	3.54
'78	3.89	'78	2.69	'55	2.60	'78	2.50	'72	3.37	'88	3.35
'55	3.84	'79	2.44	'78	2.37	'72	2.13	'55	3.32	'54	3.24
'51	3.80	'12	2.38	'24	1.91	'54	1.85	'51	2.72	'72	2.85
'41	3.40	'43	2.12	'54	1.88	'01	1.80	'54	2.72	'79	2.82
'59	2.40	'72	2.11	'36	1.79	'32	1.74	'47	2.50	'78	2.77
'56	2.36	'54	2.11	'86	1.73	'79	1.69	'88	2.33	'43	2.69
'58	2.31	'41	2.09	'32	1.69	'12	1.60	'93	2.10	'47	2.45

Source: Calculated from Trade Map (2024) data

According to Table 6, the product concentration in EU exports to Türkiye has been mostly in manufacturing-based products. In this respect, "Explosives; pyrotechnic products; matches; pyrophoric alloys; certain combustible preparations" ('36) in 2001 and "Cotton" ('52) in other years constituted the product groups with the highest export concentration. In 2022, "Man-made staple fibers" ('55), "Wool, fine or coarse animal hair; horsehair yarn and woven fabric" ('51), "Aircraft, spacecraft, and parts thereof" ('88) and "Man-made filaments; strip and the like of man-made textile materials" ('54) also recorded high

concentration values. However, the prominent product groups in the EU's import concentration from Türkiye are presented in Table 7.

Table 7: TII Results for Top 10 Product Groups with 2-digit HS Code (Import from the EU to Türkiye)

2001		2005		2010		2015		2020		2022	
Code	**Value**	**Code**	**Value**	**Code**	**Value**	**Code**	**Value**	**Code**	**Value**	**Code**	**Value**
'61	11.83	'63	10.73	'60	12.27	'60	12.63	'60	12.56	'52	11.31
'63	11.23	'61	10.30	'52	9.32	'52	10.96	'52	10.03	'60	11.07
'14	8.40	'52	7.79	'61	9.06	'61	6.51	'57	7.56	'57	7.79
'52	7.98	'60	7.11	'63	8.16	'57	6.43	'61	5.56	'55	6.79
'08	6.97	'20	6.49	'62	5.55	'63	5.86	'58	5.01	'61	5.45
'25	6.57	'62	5.88	'58	5.42	'20	5.25	'62	4.57	'63	4.84
'62	6.41	'55	5.61	'57	5.05	'54	5.03	'54	4.44	'62	4.82
'55	4.82	'08	4.41	'55	4.82	'55	4.97	'55	4.43	'25	4.69
'20	4.78	'25	4.35	'54	4.54	'58	4.56	'25	3.74	'58	4.34
'60	4.71	'58	3.83	'08	4.30	'62	4.56	'20	3.53	'54	4.28

Source: Calculated from Trade Map (2024) data

Table 7 illustrates that the highest concentration of EU imports from Türkiye in 2022 is observed in the product groups "Cotton" ('52), "Knitted or crocheted fabrics" ('60), "Carpets and other textile floor coverings" ('57), "Man-made staple fibers" ('55) and "Articles of apparel and clothing accessories, knitted or crocheted" ('61). At the same time, "Articles of apparel and clothing accessories, knitted or crocheted" ('61) in 2001 and "Other made-up textile articles; sets; worn clothing and worn textile articles; rags" ('63) in 2005 had the highest import intensity. With the exception of the "Cotton" ('52) product group, the EU's imports from Türkiye consisted mainly of manufacturing-based products and this trend continued to increase.

Table 8 illustrates the product groups in which Türkiye exhibits the greatest comparative advantage over time.

Table 8: RCA Results for Türkiye's Top 10 Product Groups with 2-digit HS Codes

2001		2005		2010		2015		2020		2022	
Code	**Value**	**Code**	**Value**	**Code**	**Value**	**Code**	**Value**	**Code**	**Value**	**Code**	**Value**
'63	10.97	'63	8.23	'57	11.97	'57	15.11	'57	17.88	'57	15.85
'61	8.67	'57	8.18	'25	8.66	'11	7.40	'25	7.00	'11	6.55
'08	8.09	'11	8.05	'11	6.72	'25	6.07	'11	6.03	'25	5.66
'14	7.51	'61	7.49	'60	6.37	'60	4.94	'60	4.92	'93	5.11
'58	7.43	'08	7.25	'08	6.17	'08	4.80	'93	4.36	'55	4.82
'57	6.40	'58	6.70	'61	5.73	'61	4.66	'55	4.15	'60	4.65
'25	6.31	'25	6.07	'58	5.46	'58	4.34	'61	4.07	'20	3.82
'55	5.54	'20	5.74	'63	5.04	'20	4.28	'58	3.89	'43	3.64
'20	5.18	'55	4.89	'55	4.40	'55	4.06	'20	3.79	'61	3.60
'62	5.03	'14	4.78	'20	4.15	'54	3.84	'08	3.72	'56	3.47

Source: Calculated from Trade Map (2024) data

Table 8 indicates that in 2001, Türkiye exhibited the highest competitive advantage in the product group "Other made-up textile articles; sets; worn clothing and worn textile articles; rags" ('63), while in 2010, 2015, 2020, and 2022, the greatest competitive advantage was observed in the product group "Carpets and other

textile floor coverings" ('57). In 2022, the product groups with the highest comparative advantage were "Products of the milling industry; malt; starches; inulin; wheat gluten" ('11), "Salt; sulphur; earths and stone; plastering materials, lime and cement" ('25), "Arms and ammunition; parts and accessories thereof" ('93), and "Man-made staple fibers" ('55). Additionally, it was determined that the competitiveness of the product groups "Man-made staple fibers" (55) and "Arms and ammunition; parts and accessories thereof" (93) has increased significantly in recent years. Table 9 presents the product groups in which the EU has exhibited the highest comparative advantage over time.

Table 9: RCA Results for the EU's Top 10 Product Groups with 2-digit HS Codes

2001		2005		2010		2015		2020		2022	
Code	**Value**	**Code**	**Value**	**Code**	**Value**	**Code**	**Value**	**Code**	**Value**	**Code**	**Value**
'45	2.55	'45	2.53	'45	2.93	'45	3.10	'45	3.02	'45	3.18
'06	1.97	'06	2.06	'06	2.25	'06	2.36	'06	2.32	'06	2.42
'04	1.92	'04	1.96	'04	2.02	'04	2.02	'30	2.06	'30	2.26
'30	1.68	'30	1.85	'30	1.99	'30	1.97	'04	1.98	'04	2.19
'19	1.67	'33	1.71	'22	1.81	'19	1.83	'22	1.79	'19	1.91
'69	1.62	'19	1.71	'48	1.79	22	1.80	'19	1.77	'22	1.89
'22	1.66	'22	1.70	'19	1.78	'01	1.77	'01	1.74	'01	1.87
'33	1.59	'48	1.65	'01	1.77	'33	1.72	'18	1.68	'18	1.82
'68	1.54	'34	1.56	'33	1.76	'48	1.71	'48	1.64	'48	1.77
'48	1.53	'01	1.56	'34	1.61	'18	1.62	'35	1.63	'35	1.73

Source: Calculated from Trade Map (2024) data

Table 9 illustrates that "Cork and articles of cork" (45) represents the most significant product group in the EU's competitive advantage over the period 2001-2022. In addition, in 2022, the EU's competitive advantage is high in "Live trees and other plants; bulbs, roots and the like; cut flowers and ornamental foliage" ('06), "Pharmaceutical products" ('30) and "Dairy produce; birds' eggs; natural honey; edible products of animal origin, not elsewhere" ('04).

Table 10 presents the product groups in which Türkiye has the greatest comparative advantage in its bilateral trade with the EU over time.

Table 10: BRCA Results for Top 10 Product Groups with 2-digit HS Code (from Türkiye to the EU)

2001		2005		2010		2015		2020		2022	
Code	**Value**	**Code**	**Value**	**Code**	**Value**	**Code**	**Value**	**Code**	**Value**	**Code**	**Value**
'63	3.71	'63	2.81	'57	3.67	'57	4.12	'57	5.11	'57	4.66
'61	2.94	'57	2.79	'25	2.66	'11	2.02	'25	2.00	'11	1.92
'08	2.74	'11	2.75	'11	2.06	'25	1.65	'11	1.73	'25	1.67
'14	2.54	'61	2.56	'60	1.95	'60	1.35	'60	1.41	'93	1.50
'58	2.52	'08	2.47	'08	1.89	'08	1.31	'93	1.25	'55	1.42
'57	2.17	'58	2.29	'61	1.76	'61	1.27	'55	1.19	'60	1.37
'25	2.14	'25	2.07	'58	1.67	'58	1.18	'61	1.17	'20	1.12
'55	1.87	'20	1.96	'63	1.55	'20	1.17	'58	1.11	'43	1.07
'20	1.75	'55	1.67	'55	1.35	'55	1.11	'20	1.08	'61	1.06
'62	1.70	'14	1.63	'20	1.27	'54	1.05	'08	1.07	'56	1.02

Source: Calculated from Trade Map (2024) data

Table 10 illustrates that the BRCA values are notably elevated in specific product categories within Türkiye's exports to the EU. In particular, the product group "Other made-up textile articles; sets; worn clothing and worn textile articles; rags" ('63) exhibited high BRCA values in 2001 and 2005, while the

product group "Carpets and other textile floor coverings" ('57) demonstrated high BRCA values in 2010, 2015, 2020, and 2022. In addition, the product groups "Products of the milling industry; malt; starches; starches; inulin; wheat gluten" ('11), "Salt; sulphur; earths and stone; plastering materials, lime and cement" ('25), "Arms and ammunition; parts and accessories thereof" ('93) and "Man-made staple fibers" ('55) also exhibited high BRCA values in recent years. Concurrently, the product groups with the highest BRCA values are predominantly manufacturing-based, rather than agriculture-based. Table 11 presents the product groups in which the EU has the highest comparative advantage in its bilateral trade with Türkiye over time.

Table 11: BRCA Results for Top 10 Product Groups with 2-digit HS Code (from the EU to Türkiye)

2001		2005		2010		2015		2020		2022	
Code	**Value**	**Code**	**Value**	**Code**	**Value**	**Code**	**Value**	**Code**	**Value**	**Code**	**Value**
'45	0.02	'45	0.03	'45	0.04	'45	0.04	'45	0.04	'45	0.05
'06	0.01	'06	0.02	'06	0.03	'06	0.03	'06	0.03	'06	0.04
'04	0.01	'04	0.02	'04	0.02	'04	0.03	'30	0.03	'30	0.03
'30	0.01	'30	0.02	'30	0.02	'30	0.02	'04	0.02	'04	0.03
'19	0.01	'33	0.02	'22	0.02	'19	0.02	'22	0.02	'19	0.03
'22	0.01	'19	0.02	'19	0.02	'22	0.02	'01	0.02	'22	0.03
'69	0.01	'22	0.02	'48	0.02	'01	0.02	'19	0.02	'01	0.03
'33	0.01	'48	0.02	'01	0.02	'33	0.02	'18	0.02	'18	0.03
'68	0.01	'34	0.02	'33	0.02	'48	0.02	'48	0.02	'48	0.03
'48	0.01	'01	0.02	'34	0.02	'18	0.02	'35	0.02	'35	0.03

Source: Calculated from Trade Map (2024) data

As illustrated in Table 11, the BRCA values associated with EU exports to Türkiye are relatively low. Given that all BRCA values are below 1, it can be concluded that no bilateral comparative advantage has been achieved in the product groups that the EU exports to Türkiye.

Table 12: The Number of Product Groups*

	TI from Türkiye to the EU (Export)	**TI from Türkiye to the EU (Import)**	**TI from the EU to Türkiye (Export)**	**TI from the EU to Türkiye (Import)**	**Türkiye RCA**	**The EU RCA**	**Türkiye BRCA**	**The EU BRCA**
2001	36	52	33	29	38	49	19	0
2005	33	49	31	33	40	57	17	0
2010	37	47	32	32	40	56	15	0
2015	38	42	30	32	43	55	10	0
2020	33	51	35	33	45	54	10	0
2022	30	56	36	35	51	58	12	0

Note: * The index value is greater than 1.

Table 12 indicates that the number of trade-intensive product groups in Türkiye's exports to the EU decreased from 36 to 30 between 2001 and 2022. In contrast, the number of trade-intensive product groups in Türkiye's imports from the EU increased from 52 to 56 over the same period. Concomitantly, the number of trade-intensive product groups in EU exports to Türkiye increased from 33 to 36, while the number of trade-intensive product groups in EU imports from Türkiye increased from 29 to 35. The number of product groups in which Türkiye has a competitive advantage increased from 38 to 51, while the number of product groups in which the EU has a competitive advantage increased from 49 to 58. In Türkiye's trade with the

EU, the number of product groups in which Türkiye has a bilateral comparative advantage decreased from 19 to 12, while the number of product groups in which the EU has a bilateral comparative advantage was not reached.

4.2. Discussion

This study presents findings that diverge from those of the Saygılı and Terzioglu (2008) study. It reveals that trade complementarity between Türkiye and the EU is high, indicating that the two sides are natural trading partners. In this regard, the findings contradict those of Topcu and Kılavuz (2012), indicating that the Customs Union confers benefits on both parties. In this regard, the study's findings align with those of Karaalp (2012). Additionally, the results are consistent with those of Karaalp (2012) and Başkol and Özözen (2019), indicating that Türkiye's comparative advantage in clothing and textile products persists in its trade with the EU. This finding aligns with the conclusions of Erlat and Erlat (2005), particularly given that textiles and clothing products are among the most labor-intensive product groups. Given that Türkiye has a comparative advantage in major processed agricultural products, it is evident that Türkiye has a higher level of competitiveness in low-value-added products compared to the EU. This is consistent with the findings of Kösekahyaoğlu (2003), Altay et al. (2009), and Eşiyok (2014). In this respect, although there has been no notable shift in Türkiye's overall competitiveness over time, there has been a partial change in recent years due to the increased competitiveness of products such as arms and ammunition. Nevertheless, as with the findings of Yılmaz and Akkaya (2020), this study demonstrates that the volume of Türkiye's foreign trade with the EU has diminished in recent years. Conversely, as evidenced in the studies conducted by Serin and Civan (2008) and Karaman et al. (2023), Türkiye exhibits a high level of competitiveness in fruit and vegetable exports to the EU. In conclusion, the results align with those of Doğan and Soyyiğit Kaya (2011), indicating a shift in export concentration from agricultural and animal products to manufacturing-based products.

5. Conclusion

In the bilateral trade between Türkiye and the EU, trade between the two sides has been found to be more complementary than competitive. This is due to the fact that the values of trade complementarity are high for both parties, and each party has a comparative advantage in different products. Consequently, the high degree of trade complementarity between the two parties suggests that they are well-suited to engage in mutually beneficial trade relations. This demonstrates the efficacy of the Customs Union between the two parties. Furthermore, since 2020, the trade complementarity between Türkiye's exports and the EU's imports has been greater than that between the EU's exports and Türkiye's imports. In this regard, Türkiye is in a more advantageous position than the EU with respect to trade complementarity.

Türkiye's export profile has undergone a notable shift, with a transition from agricultural and animal products to manufactured goods in its trade relations with the EU. In recent years, the products with the highest export intensity have been manufacturing-based products, including railways and components, copper and copper products, motor vehicles, aluminum and aluminum products, and knitted clothing.

Türkiye's imports from the EU are primarily concentrated in the following product categories: cork and cork articles, flour and pastry products, live wood and plants, and furs. The concentration of imports in these products has increased in recent years. Concurrently, the EU has demonstrated a considerable degree of competitiveness in these product categories imported by Türkiye.

The product groups comprising the majority of exports from the EU to Türkiye during the period were cotton, synthetic, and man-made fibers. Moreover, textile products, aircraft, and synthetic and artificial weaving materials have constituted a significant component of the concentration of EU exports to Türkiye in recent years.

The European Union's imports from Türkiye are primarily concentrated in textile and clothing products, with the import concentration of various textile and clothing products increasing over time. While the import concentration of knitted clothing, woven goods, plant products suitable for knitting, cotton, and

fruits was historically high, the import concentration of synthetic and artificial fibers, carpets, and floor coverings has increased in recent years.

The study indicates that both Türkiye and the EU possess competitive advantages in a multitude of product categories. Concurrently, the number of product groups in which the EU has a competitive advantage has been greater than that of Türkiye. Nevertheless, while Türkiye has a comparative advantage in 12 product groups in bilateral trade in 2022, the EU has no such advantage over Türkiye in any product group. In 2001, the number of product groups in which Türkiye had a comparative advantage in bilateral trade was 19. However, this number has decreased over the years.

Türkiye's comparative advantage over the EU is clearly dominated by textiles. However, the competitive advantage of textile products has also changed over the years. While in the past the textile products with the highest comparative advantage were ready-to-woven goods and knitted clothing, in recent years carpets and floor coverings are the textile products with the highest competitive advantage. In addition, Türkiye's competitiveness is high in processed agricultural products such as milling products and mineral-based products such as salt, sulphur, gypsum, lime and cement. What is noteworthy is that Türkiye's comparative advantage and bilateral comparative advantage in the product groups of arms and ammunition and synthetic and man-made fibers have both increased rapidly in recent years.

In light of the considerable degree of trade complementarity, it would be prudent for Türkiye to concentrate its exports to the EU on product categories that exhibit a pronounced comparative advantage and a high level of import intensity within the EU market. In this regard, textiles and clothing products merit particular attention. Although textile and clothing products are currently classified as low-value-added, Türkiye should prioritize these sectors due to its competitive advantage and the EU's import concentration in these products. Conversely, given that the product groups in which the EU demonstrates a high level of competitiveness align with those in which Türkiye exhibits a high import concentration, it would be prudent for the EU to prioritize these product groups. It is thus probable that both parties will derive greater benefit from bilateral trade.

In regard to bilateral trade, Türkiye has a competitive advantage over the EU in the export of unprocessed agricultural products, including nuts, fruits, vegetables, and cotton. The extension of the Customs Union between Türkiye and the EU to unprocessed agricultural products is anticipated to result in an enhancement of Türkiye's trade advantage vis-à-vis its trade with the EU.

In light of Türkiye's evident competitive edge in textile products vis-à-vis the EU and the latter's proclivity for importing these products, it is imperative for Türkiye to enhance the export value per kilogram of textile products. Türkiye must transition from contract manufacturing in the textile industry to products with greater added value. In order to achieve this, it is necessary to place greater emphasis on innovation, design, branding and the development of a more highly qualified workforce in the textile products industry. Furthermore, Türkiye has witnessed considerable growth in its high-tech exports to the EU, particularly in the arms and ammunition product group, reflecting the country's rising exports and competitiveness in this sector. In order to maintain Türkiye's competitive advantage in other high-tech product groups, it is essential to increase research and development (R&D) expenditures. Ideally, R&D expenditures should reach 2% of gross domestic product (GDP) or higher.

In the post-pandemic period, Türkiye must leverage its proximity to the EU to attract more investment and thereby encourage businesses to prioritize production safety over cost. In this regard, it is imperative for Türkiye to attract a greater volume of foreign direct investment (FDI), particularly from EU member states. This is essential to sustain its current foreign trade surplus with the EU and to enhance its competitive advantage. It is therefore recommended that incentives and investment mechanisms that increase FDI, especially in high technology exports, should be given greater emphasis. This will enable Türkiye to gain a competitive advantage over the EU in a number of product categories, particularly in the export of high-tech products, while simultaneously reducing its foreign trade deficit.

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References

Akay, A. B. (2023), Türkiye Azerbaijan Economic Relations: Bilateral Revealed Comparative Advantage Perspective, *Politik Ekonomik Kuram*, 7(Özel Sayı), s.225-237.

Altay, H., Özcan, S. E., & Çınar, İ. T. (2009), Türkiye'nin Avrupa Birliği (15) Pazarında Endüstriler-Arası ve Endüstri-İçi Ticaret Açısından Avantajlı Olduğu Ürün Gruplarının Belirlenmesi: 1995–2007, *Dumlupınar Üniversitesi Sosyal Bilimler Dergisi*, 23, s.159-170.

Ateş, E. (2024), Afrika Kıtası Serbest Ticaret Alanı: Türkiye Açısından Dış Ticarette Potansiyel Barındırıyor Mu?, *Anadolu Üniversitesi Sosyal Bilimler Dergisi*, 24(3), s.1295-1316.

Ateş, E., & Dilekoğlu S. (2021), Türkiye'nin Dış Ticaret Çeşitlendirmesinde Yeni Bir Pazar: Avrasya Ekonomik Birliği, *MANAS Sosyal Araştırmalar Dergisi*, 10(1), s.253-271.

Aydın, A., & Bashimov, G. (2024), Kazakistan'ın Hindistan ile İkili Ticaretine İlişkin Bir Araştırma, *Yalova Sosyal Bilimler Dergisi*, 14(2), s.189-200.

Balassa, B. (1965), Trade Liberalisation and Revealed Comparative Advantage *The Manchester School*, 33(2), s.99-123.

Bashimov, G. (2023), Rusya ile Pakistan Arasındaki İkili Ticaret (2003-2021 Dönemi), *Asya Araştırmaları Uluslararası Sosyal Bilimler Dergisi*, 7(2), s.195-204.

Başkol, M. O., & Özözen, S. (2019), Avrupa Birliği 15 Piyasasında Türk Hazır Giyim Sektörünün Rekabet Gücü ve Ürün Haritası 2004-2017, *Iğdır Üniversitesi Sosyal Bilimler Dergisi,* (Ek Sayı (2019)), s.327-352.

Brown, A. J. (1949), *Applied Economics: Aspects of World Economy in War and Peace*, London: George Allen and Unwin.

Chabi, P., & Saygili, F. (2020), The Assessment of South-South Trade Potentialities: The Case of Turkey and ECOWAS Countries, *African Journal of Economic Review*, 8(2), s.190-218.

Çelen, A., & Demirel, A. (2018), Tamamlayıcılık İndeksi Çalışması: Türkiye Örneği, *International Journal of Economic & Administrative Studies*, (20), s.101-118.

Demir, M. A. (2020), BRICS ülkelerinde ticari dinamikler: Türkiye ile BRICS grubu ülkelerin ticari yoğunluk analizi, *Bilecik Şeyh Edebali Üniversitesi Sosyal Bilimler Dergisi*, 5(TBMM 100. YIL Özel Sayısı), s.109-133.

Doğan, S., & Kaya, S. S. (2011), Gümrük Birliği Sonrasında (1996-2009) Türkiye'nin Avrupa Birliği ile Dış Ticaretinin Ülke ve Fasıl Bazlı Yoğunlaşma Analizi, *Istanbul University Econometrics and Statistics e-Journal*, (14), s.1-18.

Edjah, B. K. T., Wu, J., & Tian, J. (2022), Research on the Comparative Advantage and Complementarity of China–Ghana Agricultural Product Trade, *Sustainability*, 14(20), 13136.

Ergün Tatar, H. (2021), Dış Ticaret Yoğunluk Analizi: Türkiye ve Seçilmiş Ülkeler Analizi, *Fiscaoeconomia*, 5(2), s.522-537.

Erkan, B. & Aybudak, H.G. (2019), Analysis of the Foreign Trade Alignment of Turkey and South Korea with the Help of Trade Complementarity Index, *International Journal of Disciplines Economics & Administrative Sciences Studies,* 5(13), s.262-268.

Erkekoğlu, H., & Koçer, E. (2024), Türkiye ile Rusya Arasındaki Dış Ticaretin Farklı Endeks Türlerine Göre Analizi, *Afyon Kocatepe Üniversitesi Sosyal Bilimler Dergisi*, 26(1), s.99-112.

Erlat, G., & Erlat, H. (2005), Do Turkish Exports Have a Comparative Advantage with Respect to the European Union Market, 1999-2000, *Topics in Middle Eastern and North African Economies*, 7, s.1-17.

Eşiyok, B. A. (2014), Türkiye–AB arasında Dış Ticaretin Teknolojik Yapısı, Rekabet Gücü ve Endüstri-İçi Ticaret: Ampirik Bir Değerlendirme, *Ankara Avrupa Çalışmaları Dergisi*, 13(1), s.91-124.

EU (European Union), Facts and Figures on the European Union economy, https://european-union.europa.eu/principles-countries-history/key-facts-and-figures/economy_en, (Erişim Tarihi: 15.05.2024).

Gul, A. (2014), Analyzing Pakistan's Trade Opportunity with Turkey, *The Lahore Journal of Economics*, 19, s.349-370.

Ibrahim, K. H., & Abdulaziz, S. (2018), Nigeria-India bilateral trade relations: an analysis of trade complementarity index (TCI), *Available at SSRN 3186729*.

Karaalp, H. S. (2012), Effects of the Customs Union on Comparative Advantage of Turkish Manufacturing Industry, *International Journal of Contemporary Economics and Administrative Sciences*, 2(2), s.117-129.

Karaman, S., Özkan, B., & Yigit, F. (2023), Export Competitiveness of Türkiye Agri-food Products in the European Union and The Shanghai Cooperation Markets, *Journal of Agricultural Sciences*, 29(2), s.665-676.

Kašťáková, E., & Luptáková, A. (2023), Identification of Export Potential in Foreign Trade: Case of Slovakia in Kazakhstan, *Economic research-Ekonomska istraživanja*, 36(1), 2179510.

Kojima, K. (1964), The Pattern of International Trade Among Advanced Countries, *Hitotsubashi Journal of Economics*, 5(1), s.16-36.

Kösekahyaoğlu, L. (2003), Comparative Advantage of Turkey with Regard to the EU, *Süleyman Demirel Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 8(2), s.147-156.

Kurt Gümüş, G., & Kramskova, M. (2024), An Analysis of Bilateral Trade Relation between Turkey and Russia: Challenges and Opportunities of Russia-Ukraine War, *İstanbul Ticaret Üniversitesi Sosyal Bilimler Dergisi*, 23(50), s.1876-1902.

Liu, C., Xu, J., & Zhang, H. (2020), Competitiveness or complementarity? A Dynamic Network Analysis of International Agri-Trade along the Belt and Road, *Applied Spatial Analysis and Policy*, 13, s.349-374.

Maryam, J., Banday, U. J., & Mittal, A. (2018), Trade Intensity and Revealed Comparative Advantage: An Analysis of Intra-BRICS trade, *International Journal of Emerging Markets*, 13(5), s.1182-1195.

MFA (2022), Türkiye-AB Gümrük Birliği, https://www.mfa.gov.tr/turkiye-ab-gumruk-birligi.tr.mfa, (Erişim tarihi: 03.04.2024).

Michaely, M. (1996), *Trade Preferential Agreements in Latin America: An Ex-Ante Assessment*, World Bank Publications. No. 1583.

Özdamar, G. (2014), İmalat Sanayisinde Türkiye'nin AB ile Ticaretinin Yapısı ve Rekabet Gücü: Teknoloji Düzeylerine Göre Bir İnceleme, *Dumlupınar Üniversitesi Sosyal Bilimler Dergisi*, (41), s.11-30.

Phan, T. H., & Jeong, J. Y. (2012), *An Analysis of Korea-Vietnam Bilateral Trade Relation*, Munich Personal RePEc Archive, MPRA Paper No. 48312.

Saygılı, R. F., & Terzioğlu, B. (2008), Türkiye'nin AB'ye Katılım Sürecine Ticarette Uyumluluk Açısından Bir Bakış, *İktisat İşletme ve Finans*, 23(263), s.124-145.

Serin, V., & Civan, A. (2008), Revealed Comparative Advantage and Competitiveness: A Case Study for Turkey towards the EU, *Journal of Economic and Social research*, 10(2), s.25-41.

Shnyrkov, O. I., & Pliushch, D. S. (2019), Quantitative Analysis of Trade Complementarity between Ukraine and the EU, *Actual Problems of International Relations*, 1(141), s.89-97.

Şimşek, N., & Kurt, A. S. (2021), Evaluation of the economic relations between Turkey and Uzbekistan, *PERCEPTIONS: Journal of International Affairs*, 26(1), s.121-151.

Şimşek, N., Canaltay, C., & Şimşek, H. A. (2017a), Trade Relations Between Turkey and Kazakhstan on the 25th Anniversary of Kazakhstan's Independence, *PERCEPTIONS: Journal of International Affairs*, 22(1), s.7-28.

Şimşek, N., Şimşek, H. A., & Zhanaltay, Z. (2017b), Analysis of Bilateral Trade Relations between Turkey and Russia Federation. *Bilig*, (83), s.1-26.

Tabassum, A. (2021), Trade Intensity and Trade Complementarity between India and Bangladesh, *Webology*, 18(5), s.325-334.

TİM (2024), Avrupa Birliği Bilgi Notu, https://tim.org.tr/files/downloads/Ulke_Bilgi_Notları/AB%20Ülke%20Bilgi%20Notu.pdf, (Erişim Tarihi: 04.04.2024).

Topcu, B. A., & Kılavuz, E. (2012), Revealed Comparative Advantage and Competitiveness of the Turkish manufacturing sector in the European market, *International journal of economics and Finance Studies*, 4(2), s.21-35.

Trade Map (2024), Trade Statistics for International Business Development. https://www.trademap.org/, (Erişim Tarihi: 22.04.2024).

Utkulu, U. & İmer, H. (2009), Türk Tekstil ve Konfeksiyon Sektörünün Avrupa Birliği Tekstil ve Konfeksiyon Sektörü Karşısındaki Rekabet Gücünün Alt Sektörler Düzeyinde Ölçülmesi, *Rekabet Dergisi*, 36, s.3-43.

Vahalík, B. (2014), Regional bilateral trade analysis of the European Union, China and ASEAN, *Procedia Economics and Finance*, 12, s.709-717.

Vergil, H., & Yıldırım, E. (2006), AB-Türkiye Gümrük Birliğinin Türkiye'nin Rekabet Gücü Üzerindeki Etkileri, *Erciyes Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 26(1), s.1-17.

Wang, P. Z., Chu, L. X., & Zhao, Y. X. (2018), Trade Complementarity and Competitive Analysis between China and Countries under "the Belt and Road" Initiative, In *4th Annual International Conference on Management, Economics and Social Development (ICMESD 2018)* (s. 355-365). Atlantis Press.

World Bank (2010), Trade Indicators, https://wits.worldbank.org/wits/wits/witshelp/Content/Utilities/e1.trade_indicators.htm, (Erişim Tarihi: 10.05.2024).

Xu, N., & Li, F. (2019), Analysis of Trade Competitiveness and Complementarity between China and EAEU, *Management, Finance and Social Sciences Research*, s.992-798.

Yao, S. (2021), Trade Relations Between China and The Czech Republic: An Analysis of Complementarity and Competition, In *2021 International Conference on Transformations and Innovations in Business and Education (ICTIBE 2021)* (s. 135-141). Atlantis Press.

Yılmaz, F., & Akkaya, G. (2020), Türkiye'nin Avrupa Birliği ile Dış Ticaretinde Yoğunlaşma Analizi, *Çukurova Üniversitesi İktisadi Ve İdari Bilimler Fakültesi Dergisi*, 24(2), s.251-267.

Zheng, X., Jia, L., Bao, J., & Chen, J. (2018), A Study of Trade Complementarity between China and the Baltic States and its Development Strategies, *Amfiteatru Economic*, 20(49), s.788-803.